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10/688,947

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Masayuki Fujimoto

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CROWELL & MORING LLP  
INTELLECTUAL PROPERTY GROUP  
P.O. BOX 14300  
WASHINGTON, DC 20044-4300

EXAMINER

PHAM, HAI CHI

ART UNIT

PAPER NUMBER

2861

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/688,947

**Applicant(s)**

FUJIMOTO, MASAYUKI

**Examiner**

Hai C. Pham

**Art Unit**

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,3,5 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,5 and 11-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/13/07</u> . | 6) <input type="checkbox"/> Other: _____  |

## **FINAL REJECTION**

### ***Claim Objections***

1. Claim 2 is objected to because of the following informalities:
  - The terminology “generation” used in of the claimed limitation “heat generation ability” attributed to the circuit board and to the motor mounting member appears to be inaccurate since those items are inert and cannot generate or produce any heat, but they would conduct heat generated by the drive electronics and the drive motor, respectively.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.
3. Claims 2-3, 5, 11-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

#### **Claim 2:**

- The following limitation “the circuit board having a second heat generation ability” (emphasis added) at line 22 appears to be in contradiction with what is disclosed in the current specification, which indicates that the circuit board is made of “paper phenol” or any “other materials without heat generation function”

(Specification, paragraph bridging pages 16 and 17). The above-mentioned limitation will be interpreted as not having a heat generation ability based on the disclosure for the purpose of the current examination.

Claims 3, 5, 11-16 are dependent from claim 2 above and are therefore indefinite.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

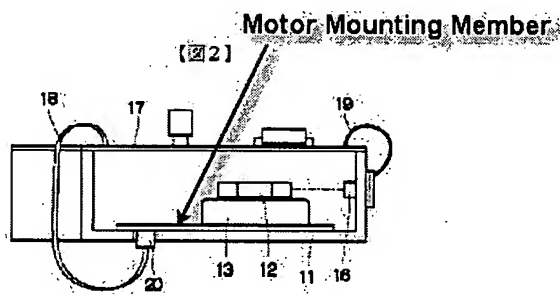
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-3 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori (JP 8-211317) in view of Miyamoto et al. (US 5,900,961) and Yoshino (JP 7-178957).

Hori discloses an image forming apparatus comprising a photosensitive drum (photo conductor, not shown) (English translation, paragraph [0004]), a frame body (casing 11) forming a laser scanning unit, a semiconductor laser (semiconductor laser light source 16) operable to emit a laser beam, the semiconductor laser being installed inside the frame body (Fig. 2), a polygon mirror (12) installed inside the frame body (Fig. 2), a motor (polygon motor 13) operable to rotate the polygon mirror, thereby causing the laser beam to scan on the photosensitive drum, the motor being installed inside the frame body (Fig. 2), a motor mounting member mounting the motor and having a first

heat generating ability (the motor mounting member as shown in Fig. 2 is a rigid substrate that more or less conducts heat generated by the polygon mirror motor 13),



a first circuit operable to drive the motor (the IC drive mounted on the circuit board 17 drives the motor 13 of the polygon mirror), a second circuit operable to drive the semiconductor laser (the IC drive mounted on the circuit board 17 drives the semiconductor laser 16), a circuit board (main circuit board 17) provided outside the frame body and mounting the first circuit and the second circuit (the main circuit board 17 contains the IC device for controlling both the semiconductor laser light source 16 and the polygon motor 13, the main circuit board 17 is facing to the outside of the casing 11 so as to be in contact with the external air) (see Abstract) (Figs. 1-3), a first flexible cable (flexible cable 18) electrically connecting the first circuit and the motor (13), and a second flexible cable (flexible cable 19) for connecting the second circuit and the semiconductor laser (16) (Fig. 2).

Hori fails to teach the circuit board being arranged in a non-overlapping manner with respect to the frame body.

Miyamoto et al. discloses an image forming apparatus comprising a photosensitive drum (23), a frame body (optical casing 1), a semiconductor laser (laser unit 202) for emitting a laser beam, the semiconductor laser being installed inside the frame body, a polygon mirror (203) for causing the laser beam to scan on a photosensitive drum (23), a motor (203) for rotating the polygon mirror, the motor being installed inside the frame body (Fig. 7B), and a circuit board (Figs. 6 and 7A) for packaging two circuits of a semiconductor laser drive circuit for controlling the driving of the semiconductor laser and a motor drive circuit for controlling the driving of the motor (the IC device 208 being an integrated circuit device, which has dual function of controlling the laser unit 202 and the polygon motor 203) (col. 4, lines 50-56), the circuit board being provided outside the frame body in a non-overlapping arrangement with respect to the frame body (Fig. 6).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to rearrange the main circuit board of the device of Hori so as to position the circuit board in a non-overlapping manner with respect to the optical casing as taught by Miyamoto et al. The motivation for doing so would have been to dispose the main circuit board further apart from the location of the polygon motor so as to reduce the effect of the radiating heat from the polygon motor. Moreover, it would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange the main circuit board of the device of Hori so as to position the circuit board in a non-overlapping manner as claimed, since it has been

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held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Hori also fails to teach the circuit board having no heat radiation function, the circuit board being made of paper phenol.

Yoshino discloses a laser printer, which includes a simple low cost electric circuit substrate (14) made of paper phenol on which a circuit pattern (32) is formed including a drive IC for driving a semiconductor laser, the paper phenol being known as not having heat radiation function.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use paper phenol for the circuit board in the device of Hori as taught by Yoshino. The motivation for doing so would have been to provide a low cost, small size and simple circuit board structure, which further prevents any short-circuit event as suggested by Yoshino at paragraph [0025].

With regard to claim 11, Hori also teaches the frame body (casing 11) including a hole (notch in the casing 11) through which the first flexible cable (flexible cable 18) is disposed for connecting the circuit board and the motor (the flexible cable 18 connects the circuit board 17 to the polygon motor via the connector 20 located in the notch made in the casing 11) (see Fig. 2) (English translation, paragraph [0012]).

With regard to claim 12, Hori teaches each of the first and second flexible cables (18 and 19) comprising a plurality of wires (Fig. 1).

With regard to claims 13-16, Hori further fails to disclose the scan start position detector for detecting a scan start position of the laser beam and the detector being a photodiode.

Miyamoto et al. discloses a scanning optical device a scan start position detector comprising a photodiode (the horizontal synchronization signal detecting unit 207 is the laser beam detecting circuit that includes a photodiode) (col. 4, lines 41-45).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Hori with the horizontal synchronization signal detecting unit as taught by Miyamoto et al. The motivation for doing so would have been to vertically align the scan lines during the image formation as it is well known in the art.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hori in view of Miyamoto et al. and Yoshino, as applied to claim 2 above, and further in view of Herloski et al. (U.S. 4,355,859).

Hori, as modified by Miyamoto et al. and Yoshino, discloses all the basic limitations of the claimed invention except for the laser being angularly adjustable.

Herloski et al. discloses a raster scanning apparatus having a laser for generating a scanning beam, the apparatus is wherein the laser is provided with an assembly for angularly adjusting the position of the laser so as to align the laser beam with the optical axis of the scanner (col. 1, line 62 to col. 2, line 35).



It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the adjustable mechanism for adjusting the position of the laser in the device of Hori as taught by Herloski et al. The motivation for doing so would have been to allow the laser printer to align the laser beam with the optical axis of the optical scanner as suggested by Herloski et al.

### ***Response to Arguments***

7. Applicant's arguments filed 04/03/07 have been fully considered but they are not persuasive.

Applicant argues that the references fail to teach the "feature of the circuit board being disposed in a substantially non-overlapping arrangement with the frame body" and that in Miyamoto "most of the circuit board 31 is disposed inside and is sealed in the casing 21". The examiner respectfully disagrees. Miyamoto teaches most of the electronics making up the circuit board 31 for driving the drive motor 203 of the polygon mirror and the laser unit 202 is disposed outside of the casing 21 (Fig. 6) and that only the wiring is extended inside the casing such that the electrical connection between the circuit board and the drive motor and the laser unit is made possible.

Applicant further argues that the cited prior art fails to teach or suggest the claimed feature with regard to "the circuit board having a second heat generation ability which is smaller than the first heat generation ability of the motor mounting member". However, as discussed in the above paragraph 3, the circuit board has no heat [generation] radiation ability, a limitation being met by the teaching of Yoshida, which

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discloses a simple low cost electric circuit substrate 14 made of paper phenol on which a circuit pattern 32 is formed including a drive IC for driving a semiconductor laser, the paper phenol being known as not having heat radiating function. Therefore, Hori in view of Yoshida teaches the motor mounting member having a heat radiating ability, which is naturally greater than that of the paper phenol.

### ***Conclusion***

8. Applicant's amendment, which changed the scope of the base claim, necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



HAI PHAM  
PRIMARY EXAMINER

June 6, 2007